# REPORT

OF THE

# CANADIAN ARCTIC EXPEDITION 1913-18

## VOLUME VIII: MOLLUSKS, ECHINODERMS, COELENTERATES, ETC.

### PART D: BRYOZOA

By Raymond C. Osburn

## SOUTHERN PARTY—1913-16

G
670
.1913 C2t
V.8, Pt D
c.3

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1923

Issued February 20, 1923

G
670
1913
C2t
v.008
pt.D
c.3

# Report of the Canadian Arctic Expedition, 1913-18.

## VOLUME I: GENERAL INTRODUCTION, NARRATIVE, ETC.

Part A: NORTHERN PARTY, 1913-18. By Vilhjalmur Stefansson.....*(In preparation)*.
Part B: SOUTHERN PARTY, 1913-16. By Rudolph Martin Anderson.....*(In preparation)*.

## VOLUME II: MAMMALS AND BIRDS

Part A: MAMMALS OF WESTERN ARCTIC AMERICA.
By Rudolph Martin Anderson.....*(In preparation)*.
Part B: BIRDS OF WESTERN ARCTIC AMERICA.
By R. M. Anderson and P. A. Taverner.....*(In preparation)*.

## VOLUME III: INSECTS

INTRODUCTION. By C. Gordon Hewitt.....*(Issued December 10, 1920)*.
Part A: COLLEMBOLA. By Justus W. Folsom.....*(Issued July 10, 1919)*.
Part B: NEUROPTEROID INSECTS. By Nathan Banks.....*(Issued July 11, 1919)*.
Part C: DIPTERA.
Crane-flies. By Charles P. Alexander.
Mosquitoes. By Harrison G. Dyar.
Diptera (excluding Tipulidæ and Culicidæ). By J. R. Malloch.....*(Issued July 14, 1919)*.
Part D: MALLOPHAGA AND ANOPLURA.
Mallophaga. By A. W. Baker.
Anoplura. By G. F. Ferris and G. H. F. Nuttall.....*(Issued September 18, 1919)*.
Part E: COLEOPTERA.
Forest Insects, including Ipidæ, Cerambycidæ, and Buprestidæ. By J. M. Swaine.
Carabidæ and Silphidæ. By H. C. Fall.
Coccinellidæ, Elateridæ, Chrysomelidæ and Rhynchophora (excluding Ipidæ).
By C. W. Leng.
Dytiscidæ. By J. D. Sherman, Jr.....*(Issued December 18, 1919)*.
Part F: HEMIPTERA. By Edward P. VanDuzee.....*(Issued July 11, 1919)*.
Part G: HYMENOPTERA AND PLANT GALLS.
Sawflies. (Tenthredinoidea). By Alex. D. MacGillivray.
Parasitic Hymenoptera. By Charles T. Brues.
Wasps and Bees. By F. W. L. Sladen.
Plant Galls. By E. Porter Felt.....*(Issued November 3, 1919)*.
Part H: SPIDERS, MITES AND MYRIAPODS.
Spiders. By J. H. Emerton.
Mites. By Nathan Banks.
Myriapods. By Ralph V. Chamberlin.....*(Issued July 14, 1919)*.
Part I: LEPIDOPTERA. By Arthur Gibson.....*(Issued January 10, 1920)*.
Part J: ORTHOPTERA. By E. M. Walker.....*(Issued September 4, 1920)*.
Part K: INSECT LIFE ON THE WESTERN ARCTIC COAST OF AMERICA.
By Frits Johansen.....*(Issued November 7, 1921)*.
Part L: GENERAL INDEX.....*(Issued December , 1922)*.

## VOLUME IV: BOTANY

Part A: FRESHWATER ALGAE AND FRESHWATER DIATOMS. By Charles W. Lowe.
.....*(In press)*.
Part B: MARINE ALGÆ. By F. S. Collins.....*(In preparation)*.
Part C: FUNGI. By John Dearness.....*(In press)*.
Part D: LICHENS. By G. K. Merrill.....*(In preparation)*.
Part E: MOSSES. By R. S. Williams.....*(Issued February 8, 1921)*.

## VOLUME V: BOTANY

Part A: VASCULAR PLANTS. By James M. Macoun and Theo. Holm.....*(Issued October 14, 1921)*.
Part B: CONTRIBUTIONS TO MORPHOLOGY, SYNONYMY, AND GEOGRAPHICAL DISTRIBUTION OF ARCTIC PLANTS. By Theo. Holm.....*(Issued February 10, 1922)*.
Part C: GENERAL NOTES ON ARCTIC VEGETATION. By Frits Johansen. *(In preparation)*

## VOLUME VI: FISHES, TUNICATES, ETC.

Part A: FISHES. By F. Johansen.....*(In preparation)*.
Part B: ASCIDIANS, ETC. By A. G. Huntsman.....*(Issued November 29, 1922)*.

## VOLUME VII: CRUSTACEA

Part A: DECAPOD CRUSTACEANS. By Mary J. Rathbun.....*(Issued August 18, 1919)*.
Part B: SCHIZOPOD CRUSTACEANS. By Waldo L. Schmitt.....*(Issued September 22, 1919)*.
Part C: CUMACEA. By W. T. Calman.....*(Issued October 15, 1920)*.
Part D: ISOPODA. By P. L. Boone.....*(Issued November 10, 1920)*.
Part E: AMPHIPODA. By Clarence R. Shoemaker.....*(Issued September 7, 1920)*.
Part F: PYCNOGONIDA. Leon J. Cole.....*(In press, January 3, 1921)*.
Part G: EUPHYLLOPODA. By F. Johansen.....*(Issued May 10, 1922)*.
Part H: CLADOCERA. By Chancey Juday.....*(Issued June 23, 1920)*.
Part I: OSTRACODA. By R. W. Sharpe.....*(In preparation)*.
Part J: FRESHWATER COPEPODA. By C. Dwight Marsh.....*(Issued April 21, 1920)*.
Part K: MARINE COPEPODA. By A. Willey.....*(Issued June 5, 1920)*.
Part L: PARASITIC COPEPODA. By Charles B. Wilson.....*(Issued August , 1920)*.
Part M: CIRRIPEDIA. By H. A. Pilsbry.....*(In preparation)*.
Part N: THE CRUSTACEAN LIFE OF SOME ARCTIC LAGOONS, LAKES AND PONDS.
By F. Johansen.....*(Issued December 30, 1922)*.

# REPORT

OF THE

# CANADIAN ARCTIC EXPEDITION 1913-18

## VOLUME VIII: MOLLUSKS, ECHINODERMS, COELENTERATES, ETC.

### PART D: BRYOZOA

By Raymond C. Osburn

## SOUTHERN PARTY—1913-16

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1923

Issued February 20, 1923.

49889—1

# Bryozoa of the Canadian Arctic Expedition, 1913-18

By Raymond C. Osburn

From the Kara sea westward to the American archipelago the marine bryozoa are perhaps as well known as in any other part of the world. Beyond these limits we have known practically nothing of the circumpolar distribution of this group. The bryozoan studies of Hincks (1884) and Robertson (1900) on the British Columbian and southern Alaskan species have indicated similarity to the northern Atlantic fauna and the supposition has been general that most of the arctic bryozoa are circumpolar in distribution.

The study of the bryzoan collections made by the Canadian Arctic Expedition, 1913-18, confirms this belief. Though this material contains only 48 species, and is therefore probably not half of the complete list that might be found in the region covered by the survey, all those obtained have previously been taken elsewhere and for the most part are well distributed in the arctic waters thus far explored.

The region collected over extends from Bernard harbour, on Dolphin and Union strait, westward to Grantley harbour, on Bering strait, or from about 115 to 165 degrees west longitude.

To make the series more complete for arctic America, I have included in the report the species taken farther eastward in Hudson bay and strait by the *Diana* and *Neptune* expeditions in the years 1897 and 1903-1904 respectively.

The bryozoa of Greenland have been quite thoroughly studied,* and Nordgaard (1906) has reported on 77 species taken in the region of North Devon island, just west of Baffin bay.

Our knowledge of the arctic bryozoa may be said to have made a partial advance some 80 degrees of longitude farther westward by the work of the Canadian Arctic Expedition, 1913-18. The collections are too small and the area covered too limited to yield more than a partial view of the distribution in this region.

There still remains a vast region north of Siberia from Bering strait to the Kara sea, 165 degrees west longitude to 70 degrees east longitude, or nearly a third of the circumpolar area, in which the bryozoan fauna is quite unknown to us as yet. There can, however, be little doubt that the species will be found to be very similar to those of other arctic waters.

Nordgaard (1917, p, 90) has indicated that "there seems to be some difference between the arctic region of the Atlantic and that of the Pacific." However, it may be that when the unexplored regions of the Arctic ocean have been studied and the regions in which but little investigation has been made, are better known, we may come to the conclusion that there is no fundamental difference. It is probably to be expected that certain species may occur in limited regions of the arctic seas, due to recent distribution from more southerly waters or for some, at present, unknown reason, but the conditions of life in the waters about the north pole and for an average of 20 degrees to the southward are so constant that a fairly uniform distribution of species is to be ex-

*For a digest of the work done and a complete list of the 186 species and varieties known from Greenland, see Osburn, 1919.



49889—1½

pected. One exception which Nordgaard makes is that of *Callopora spitzbergensis*, "hitherto obtained only in Spitzbergen waters," but the writer has recently recorded this species from western Greenland (1919, p. 609) and, in the present paper, from as far west as 161 degrees, 25 minutes west longitude, northwestern Alaska. The species is therefore known to occur more than half way around the pole and is unknown only in the region north of Siberia, in which no studies have been made. In the "Bryozoa of the Crocker Land Expedition" (1919), the writer added six species to the Greenland fauna, out of 50 reported on, which were already known to occur in arctic waters north of Europe. I am therefore of the opinion that when our records of arctic bryozoa are fairly complete for the entire region around the North Pole, we will find that practically all of the true Arctic species are circumpolar in distribution.

In the following report all the species taken by the Canadian Arctic Expedition, 1913-18, were collected by Mr. Frits Johansen; those of the *Diana* expedition were collected by Dr. A. P. Low and Commander Wm. Wakeham, and those of the *Neptune* expedition by Mr. A. Halkett. For the sake of brevity in recording, these will be referred to merely as "C.A.E." "Diana," and "Neptune." A few other scattered records from far northern regions are included.

The species are all found in the Victoria Memorial Museum, Ottawa, Canada.

The localities where the specimens were collected, arranged in order from west to east are as follows:—

WESTERN (Canadian Arctic Expedition, 1913-14-15)

1. Station 20*b*, Grantley harbour, Port Clarence, Alaska, lat. 65 15′ N., long, 166° 15 W.
2. Station 23, northeast of Icy Cape, Alaska, lat. 70° 24′ N., long. 161° 25′ W.
3. Station 24, Point Barrow, Alaska, 71° 22′ N., long, 156° 05′ W.
4. Station 27*s*, Collinson Point, Camden bay, Alaska, long. 69° 59′ N., long. 144° 50′ W.
5. Station 42*c*, west of Cockburn point, Dolphin and Union strait, Northwest Territories, lat. 68° 50′ N., long. 115° 15′ W.
6. Station 43*a*, off Cockburn point, lat. 68° 50′ N., long. 115° 15′ W.
7. Station 37*b*, Bernard harbour, Dolphin and Union strait, Northwest Territories, lat. 68° 47′ N., long, 114° 50′ N.
8. Station 37*e*, Bernard harbour.
9. Station 41*b*, Bernard harbour.
10. Station 41*c*, Bernard harbour.
11. Stapylton bay, Dolphin and Union strait, lat. 68° 55′ N., long. 116° 30′ W.

EASTERN (*Diana* Expedition, 1897; *Neptune* Expedition, 1904)

12. North Somerset island, district of Franklin, Northwest Territories, lat. about 72° N., long. 95° W. *Neptune* expedition, 1904.
13. Richmond gulf, east side of Hudson bay, lat. about 57° N., long. 77° W. A. P. Low, 1899.
14. King George sound, Hudson strait, about 62° N., long, 73° W. *Diana* expedition, 1897.
15. Port Burwell, Ungava bay, Hudson strait, Quebec, about 60° N., long. 64° W. *Neptune* expedition, 1904.

## CYCLOSTOMATA

### **Crisia denticulata** (Lamarck)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station, August 19, 1913, dredged at 18 to 20 meters, one colony with two ovicells; also off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, three colonies without ovicells, on worm tubes.

### **Crisia eburnea** (Linné)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, two colonies, with ovicells, on *Callopora spitzbergensis*.

### **Tubulipora flabellaris** (Fabricius)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, one small colony on *Callopora spitzbergensis*.

### **Idomonea atlantica** (Johnston)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43**a**, 100 meters, Sept. 13, 1915, two colonies attached to a worm tube.

### **Lichenopora verrucaria** (Fabricius)

Bernard harbour, Dolphin and Union strait, C.A.E. station 37*b*, 2 to 3 fathoms, Aug. 25, 1914, one colony on an alga; C.A.E. Station 41*c*, July 28, 1915, 10 meters, on algae; C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, abundant on *Laminaria* and less common on *Fucus;* west of Cockburn point, Dolphin and Union strait, C.A.E. Station 43*c*, 20 to 30 meters, Sept. 14, 1915, many colonies on *Laminaria*.

*Neptune* Expedition: Port Burwell, Ungava, July 28, 1904; Hudson Bay, 1904, on hydroid stems; and North Somerset island, Aug., 1904, on beach.

### **Lichenopora hispida** (Fleming)

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms, one colony on a dead shell.

### **Stomatopora fungia** (Couch)?

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, several colonies, recumbent basal portions only, on shells. The fasciated bases of erect portions are present, but the erect branches seem all to have been lost.

### **Diplosolen (Diastopora) obelium** (Johnston)

King George sound, Hudson strait, Ungava, Sept. 9, 1897, 40 fathoms, *Diana* Expedition, two colonies, with ooecia, on a dead shell.

### **Entalophora** sp.

Dolphin and Union strait, off Cockburn point, C.E.A. Station 43**a**, 100 meters, Sept. 13, 1915.

The species of *Entalophora* are in such a tangle that, in the absence of perfect specimens with ovicells, I decline to name the present one. There is one specimen, about 15 mm. high, dichotomously divided into four branches. The free portions of the zooecia are more than twice as long as the diameter of the zooecium, irregularly distributed around the stem, and project in an irregular manner. Two smaller specimens are also present, one of them with an ovicell so broken as to be useless for purposes of identification. The species may be the *deflexa* of Couch.

### **Entalophora** sp.

Lat. 70° 24′ N., long. 161° 25′ W., off northern Alaska, C.A.E. Station 23, 18 to 20 meters., Aug. 19, 1913.

This species, of which there are several specimens, is much smaller than the preceding, the free portions of the zooecia being shorter and narrower in diameter, and more conspicuously punctate. There are no ovicells, and I have no idea as to its identity.

If exact identification were possible, the occurrence of these two species in arctic waters would be interesting. *E. clavata* (Busk) and *E. deflexa* have been recorded for Greenland, and *E. capitata* Robertson for southern Alaskan waters, but little is known of the arctic species, and the genus is mostly southern in distribution.

## CTENOSTOMATA

### **Alcyonidium mamillatum** Alder

Off Cockburn point, Dolphin and Union strait, at 100 meters, C.A.E. Station 43*a*, Sept. 13, 1915, a colony of a few individuals on a hydroid stem.

Richmond gulf, East side of Hudson bay, 15-15 fathoms, June, 1899, A. P. Low, collector. Branched specimens an inch or more in height.

These colonies had all the appearance of those growing on hydroid stems, but examination proved that they were growing free and branching, with no stem of any sort at the center. I believe this habit has not been recorded for this species, though it is common in the genus.

### **Nolella dilatata** (Hincks)

Bernard harbour, C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, a number of small colonies on *Fucus*.

## CHILOSTOMATA

### **Gemellaria loricata** (Linné)

Point Barrow, Alaska, on sandspit, C.A.E. Station 24, many colonies two to three inches high attached to shells, etc., Aug. 23, 1913; Dolphin and Union strait, off Stapylton bay, C.A.E. Station 43*b*, 50 to 60 meters, one colony, Sept. 14, 1915; Grantley harbour, Port Clarence, Alaska, C.A.E. Station 20*b*, July 30, 1913, one good-sized colony attached to a hydroid, at 2 to 3 fathoms; Collinson point, Camden bay, C.A.E. Station 27*s*, Oct. 3, 1913, 3 fathoms, several colonies; C.A.E. Station 23, lat. 70° 24′ N., long. 161° 25′ W., a few small colonies, at 9 to 10 fathoms.

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms.

### **Dendrobeania murrayana** (Johnston)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, one colony of the typical variety attached to a hydroid stem.

### **Dendrobeania murrayana** var. **fruticosa** (Packard)

Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, 2 colonies.

King George sound, south side of Hudson strait, Ungava, Sept. 9, 1897, 40 fathoms, *Diana* Expedition, several colonies.

**Dendrobeania murrayana** var. **quadridentata** (Lovén)

Dolphin and Union strait, C.A.E Station 43*b*, 50 to 60 meters, Sept. 14, 1915, 1 colony on a pebble.

This specimen varies from uniserial to quadriserial in different parts of the colony. There are no avicularia and the zooecial characters are those described for *quadridentata*.

**Scrupocellaria scabra** (Van Beneden)

Lat. 70° 24′ N., long. 161° 25° W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, numerous colonies nearly an inch in height growing on sponges, pebbles and on *Callopora spitsbergensis*; Bernard harbour, C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, several small colonies on *Fucus*.

Dorsal vibracula are not uncommon. The large scutes mentioned by Waters (Bryozoa from Franz Josef Land, p. 54) as characteristic of St. Lawrence and Greenland specimens, are very noticeable, though some specimens show the smaller type.

**Caberea ellisi** (Fleming)

Lat. 70° 25′ N., long. 161° 24′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, one small portion of a colony among *Scrupocellaria scabra*.

**Bicellaria ciliata** (Linné)

Dolphin and Union strait, off Cockburn point, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, one colony with numerous ovicells.

It was a surprise to find this species in the collections, as it is commonly supposed to be more southern in its distribution. However, Nordgaard (1918, p. 27) indicates that G. O. Sars took it at Bodö, the northernmost point of Norway. It is known from both sides of the North Atlantic, the Mediterranean and Red seas, South Africa and Australia. It has not been noted on the Pacific side of North America, unless indeed, the *Stirparia ciliata* of Dr. Alice Robertson (1905, p. 279, figs. 67-71) may be a variety of this species, as both her figures and description lead one to suspect.

**Menipea smitti** Norman

Dolphin and Union strait, off Cockburn point, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, one small portion of a colony with ovicells. It is a high-arctic species, hitherto known from the Kara sea westward to Greenland.

*Menipea pribilofi* Robertson has been recorded by the writer from the Pribilof islands, Bering sea, where it was taken from the stomach of a king eider (Osburn, 1921, p. 454).

**Membranipora serrulata** (Busk)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, one small portion of a colony.

**Callopora discreta** (Hincks)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, several colonies on shells.

**Callopora lineata** (Linne)

Bernard harbour, C.A.E. Station 37*b*, 2 to 3 fathoms, Aug. 25, 1914, one colony on an alga.

### Callopora craticula (Alder)

Bernard harbour, C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, one well-developed colony on *Fucus;* off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, September 13, 1915, and Station 43c 20 to 30 meters, Sept. 14, 1915, several colonies on *Laminaria.*

### Callopora cymbaeformis (Hincks)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, one small colony on a hydroid stem.

Hudson bay, *Neptune* expedition, 1904, on hydroid stems; south side of Hudson strait, *Diana* Expedition, 1897, on stem of *Boltenia ovifera.*

### Callopora nigrans (Hincks)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, one colony on a pebble.

There is some variation in the position of the avicularia. Usually these are situated at the distal corners of the zooecium, but occasionally they are placed as much as one third of the way back toward the proximal end. The avicularian chambers also sometimes appear to be crowded together so closely as to form one structure, in which case the avicularian mandibles are lacking and a kenozooecium results. I am of the opinion that this is the nature of the structure which Nordgaard (1906, p. 13, Pl, 1, fig. 8) interprets as an ooecium. If my interpretation is correct, the presence of rosette plates communicating with the zooecium in advance of it would require no explanation, while on Nordgaard's interpretation this feature would be unique and difficult of explanation. In Nordgaard's figure 8, that part labeled "proximal wall of the ooecium" should be the distal wall of the endozooecial ooecium. The internal structure of the zooecium also indicates that the ooecia are endozooecial.

### Callopora spitzbergensis (Bidenkap)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, numerous portions of colonies, one young colony inside of a dead *Chrysodomus*-shell.

King George sound, Hudson strait, Ungava, Sept. 9, 1897, *Diana* Expedition, 40 fathoms, several colonies, with ooecia.

Some of the specimens are bilaminate. There is much variation in the size of the avicularium and it may be turned in various directions. Some of the zooecia in specimens from both localities bear a short erect spine at each distal corner as figured by Smitt (1868, Pl. XX, fig. 35). Nordgaard (1918, p. 45) states that he has never seen the spines, and they appear to be of rare occurrence.

What seems to be a variety of this occurred among the material from C.A.E. Station 23. In this one small specimen the zooecia are smaller, the avicularia are smaller, and there are sometimes two of them, at the distal corners of the zooecium and faced toward each other. The ooecium and the zooecial characters are similar to those of *spitzbergensis* and the dorsal wall is similarly perforated.

### Tegella unicornis (Fleming)

Bernard harbour, C.A.E. Station 37*e*, 2 fathoms, Sept. 1, 1914, one colony on *Laminaria.*

North Somerset, Aug., 1904, *Neptune* Expedition, on algae.

### Tegella unicornis var. armifera (Hincks)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, one colony on a sponge and one on *Callopora spitzbergensis;* Bernard harbour, C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, several colonies on *Fucus.*

### Cribrilina punctata (Hassall)

Bernard harbour, C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, one young colony on *Fucus.*

### Cribrilina annulata (Fabricius)

Bernard harbour, C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, abundant on *Fucus;* off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, one small colony on a worm tube.

North Somerset, Aug., 1904, *Neptune* Expedition, on algae; King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms.

### Amphiblestrum trifolium (Wood)

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms, one colony on a barnacle.

### Hippothoa hyalina (Linné)

Bernard harbour, C.A.E. Station, 41*f*, 5 meters, Aug. 1, 1915, one colony on *Fucus;* Bernard harbour, C.A.E. Station 37*e*, 2 fathoms, Sept. 1, 1914, one colony on *Laminaria;* Collinson point, Alaska, C.A.E. Station 27*s*, 3 fathoms, Oct. 4, 1913, common and well developed on hydroid stems.

Port Burwell, Ungava, July 28 and Sept. 4, 1904, on algae; Hudson bay, 1904, on hydroid stems; and North Somerset, Aug., 1904, on algae, all taken by the *Neptune* Expedition.

### Harmeria scutulata (Busk)

Bernard harbour, C.A.E. Station 41*f*, 5 meters, Aug. 1, 1915, six colonies, the largest only 3 mm. in diameter, but with oœcia, on *Fucus.*

### Schizomavicella auriculata (Hassall)

Bernard harbour, C.A.E. Station 41*f*, 5 meters, August 1, 1915, one small colony.

### Schizoporella sinuosa (Busk)

Bernard harbour, C. A.E. Station 41f, 5 meters, August 1, 1915, one colony.

King George sound, Hudson strait, Ungava, 40 fathoms, Sept. 9, 1897, *Diana* Expedition, one colony.

### Retepora elongata (Smitt)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, one small portion of a colony.

### Myriozoum crustaceum (Smitt)

South side of Hudson strait, *Diana* Expedition, 1897, on stem of *Boltenia ovifera.*

*Myriozoum subgracile* d'Orbigny was reported by the writer from the stomach of a king eid[illegible]t St. George island, Bering sea (Osburn, 1921, p, 451).

**Microporella ciliata** (Pallas)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, one small colony on a worm tube.

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms, one small colony on a barnacle.

**Peristomella (Escharoides) jacksoni** (Waters)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, two small colonies on shells.

**Smittina solida** (Stimpson)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, several colonies attached to shells.

**Smittina concinna** (Busk)

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms. One colony with ooecia, on a dead shell.

This species in recent years, has been shifted back and forth between *Porella* and *Smittina*, by various authors. According to the most recent discriminating study by Canu and Bassler (1920, p. 457) its mode of calcification, as well as the presence of a lyrula and cardelles, shows it to be a *Smittina*.

**Smittina reticulato-punctata** (Hincks)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, Aug. 19, 1913, 9 to 10 fathoms, several small colonies.

**Smittina bella** (Busk)

Point Barrow, Alaska, on sandspit, on beach, C.A.E. Station 24, end of August, 1913, one large, highly calcified, dead and somewhat worn colony on a *Buccinum*-shell; lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, a similar specimen on a *Chrysodomus*-shell.

**Smittina (Porella) laevis** (Fleming)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915. A portion of one colony on a dead shell.

Canu and Bassler (1920, p. 457) point out that this species must be removed from the genus *Porella* on account of its mode of calcification (pleurocoyst) in spite of the absence of a lyrula.

**Mucronella (Escharella) indivisa** (Levinsen)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, a number of well developed colonies on shells and one on a worm tube.

**Mucronella ventricosa** (Hassall)

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms, several colonies on barnacles.

**Rhamphostomella bilaminata** (Hincks)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, Aug. 19, 1913, 9 to 10 fathoms, one small colony on a hydroid stem.

### Porella acutirostris Smitt

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms, one colony with ovicells, on a dead shell.

### Porella compressa Sowerby

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms. Two small colonies, one erect to a height of 5 mm., on a barnacle.

### Porella patula (M. Sars)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915. One minute, but heavily calcified colony on a shell.

### Cysticella saccata (Busk)

Lat. 70° 24′ N., long., 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, Aug. 19, 1913, several young, unbranched colonies, about 5 to 8 mm. high, attached to a complex hydroid. Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters, Sept. 13, 1915, several fragments.

King George Sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms. One colony on a barnacle.

### Cylindroporella tubulosa (Norman)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, Sept, 13 1915, 50 fathoms, One young colony on a shell.

### Lepraliella contigua (Smitt)

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms. One colony on a barnacle.

### Cheilopora sincera (Smitt)

Off Cockburn point, Dolphin and Union strait, C.A.E. Station 43*a*, 100 meters. Three small colonies without ooecia.

### Cheilopora praelucida (Hincks)

Off Cockburn point, Dolphin and Union strait, Station 43*a*. 100 meters, Sept. 13, 1915. One colony on a shell, very young, without ooecia.

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms. One colony without ooecia.

The writer is of the opinion that *praelucida* will prove to be not more than a variety of *C. sincera*. There seems to be much variability in the length and breadth of the mucro. Hincks (1884, p, 27) states in his original description that *praelucida* has no avicularia, and again (1888, p, 225) that the processes at each side of the peristome are not really avicularia. Osburn (1912, p. 283) has shown that some of these processes may bear avicularia, while in others the avicularia are suppressed. The facts are these: some individuals and some entire colonies are devoid of avicularia, others have degenerate aviculara and still others fully developed avicularia similar to those of *sincera*. The peristome rises higher and the mucro is larger in typical *praelucida*, but these characters show considerable variation and apparently intergrade. Other zooecial characters seem to agree. As all my specimens from the present collection are young, I hesitate to positively merge the species.

**Schizomopora (Cellepora) surcularis** (Packard)

Lat. 70° 24′ N., long. 161° 25′ W., C.A.E. Station 23, 9 to 10 fathoms, August 19, 1913. One young colony, attached to a hydroid, consisted of only a few zooecia.

King George sound, Hudson strait, Ungava, *Diana* Expedition, Sept. 9, 1897, 40 fathoms. Several small colonies were attached to barnacles.

The writer has listed the species from St. Paul island, one of the Pribilof group, in the Bering sea, where it was taken from the stomachs of the Pacific and king eiders.

THE OHIO STATE UNIVERSITY,
DEPARTMENT OF ZOOLOGY AND ENTOMOLOGY,
COLUMBUS, OHIO.

## APPENDIX

Since the body of this report was prepared, the writer's attention has been called to the omission of a brief reference to Bryozoa from Northern Alaska. John Murdoch, in the Report of the International Polar Expedition to Point Barrow, Alaska (Washington, 1885) mentions three species taken on that expedition pages (167, 168 and 170). The species listed by Murdoch are as follows:

**Gemellaria loricata** (Linne)

Washed up on the beach at Point Barrow.

**Flustra papyrea** (Pallas) Smitt

Point Franklin, 13¼ fathoms, and Plover bay, Siberia. This adds another species to the list for this region and if properly identified it should now be recorded as *F. carbasea* Solander.

**Leieschara subgracilis** (D'Orbigny)

Off Point Franklin. This species was not found among the collections of the Canadian Arctic Expedition. It is now placed in the genus *Myriozoum*.

Murdoch mentions also *Membranipora* sp. and *Discopora* sp.

## LITERATURE CITED

CANU, F., and BASSLER, R. S.
1920. North American Early Tertiary Bryozoa. U. S. Nat. Mus. Bulletin 106, pp. 1-879, pls. 1-162.

HINCKS, THOS.
1884. Polyzoa of the Queen Charlotte Is. Reprint from Geol. and Nat. Hist. Survey of Canada, Ottawa.
1888. Polyzoa of the St. Lawrence. Ann. Mag. Nat. Hist., S. 6, Vol. 1, pp. 214-227, pls. XIV–XV.

NORDGAARD, O.
1906. Bryozoa from the 2nd *Fram* Expedition, 1898-1902. The Society of Arts and Sciences of Kristiania.
1918. Bryozoa from the Arctic Regions. Tromsö Museum's Aarshefter 40 (1917), nr. 1.

OSBURN, R. C.
1912. Bryozoa from Labrador, Newfoundland and Nova Scotia, collected by Dr. Owen Bryant. Proc. U. S. Nat. Mus., Vol. 43, pp. 275-289, pl. 34.
1919. Bryozoa of the Crocker Land Expedition. Am. Mus. Nat. History, Vol. XLI, Art. XIX, pp. 603-624.
1921. Bryozoa as Food for Other Animals, Science, U. S., Vol. LIII, No. 13176, pp. 451-453, May 13, 1921.

ROBERTSON, ALICE.
1900. Papers from the Harriman Alaska Expedition. The Bryozoa. Proc. Wash. Acad. Sci., Vol. II, pp. 315-335, pls. XIX-XXI.
1905. Non-incrusting Chilostomatous Bryozoa of the West Coast of N. A. Univ. of Calif. Pub., Zool., Vol. II, No. 5.

SMITT, F. A.
1868. Kritisk Förteckning öfver Skandinaviens Hafsbryozoer. Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar, Stockholm (1867). Bihang, pp. 1-230, Tafl. XXIV-XXVIII.

WATERS,
1900. Bryozoa from Franz-Josef Land, Part 1, Linn. Soc. Journ. Zool., Vol. XXVIII, pp. 43-105, pl. 7-12.

# Report of the Canadian Arctic Expedition, 1913-18.

## VOLUME VIII: MOLLUSKS, ECHINODERMS, COELENTERATES, ETC.

Part A: MOLLUSKS, RECENT AND PLEISTOCENE. By William H. Dall. *(Issued September 24, 1919).*

Part B: CEPHALOPODA AND PTEROPODA.
Cephalopoda. By S. S. Berry.
Pteropoda. By W. F. Clapp.....*(In preparation).*

Part C: ECHINODERMS. By Austin H. Clark.....*(Issued April 6, 1920).*
Part D: BRYOZOA. By R. C. Osburn.....*(In press).*
Part E: ROTATORIA. By H. K. Harring.....*(Issued December 31, 1921).*
Part F: CHAETOGNATHA. By A. G. Huntsman.....*(In preparation).*
Part G: ALCYONARIA AND ACTINARIA. By A. E. Verrill.....*(Issued April 28, 1919).*
Part H: MEDUSAE AND CTENOPHORA. By H. B. Bigelow.....*(Issued June 30, 1920).*
Part I: HYDROIDS. By C. McLean Fraser.....*(Issued August 24, 1922).*
Part J: PORIFERA. By A. Dendy.....*(In preparation).*

## VOLUME IX: ANNELIDS, PARASITIC WORMS, PROTOZOANS, ETC.

Part A: OLIGOCHAETA.
Lumbriculidæ. By Frank Smith.
Enchytralidæ. By Paul S. Welch.....*(Issued September 29, 1919).*
Part B: POLYCHAETA. By Ralph V. Chamberlin.....*(Issued November 18, 1920).*
Part C: HIRUDINEA. By J. P. Moore.....*(Issued February 4, 1921).*
Part D: GEPHYREA. By Ralph V. Chamberlin.....*(Issued June 10, 1920).*
Part E: ACANTHOCEPHALA. By H. J. Van Cleave.....*(Issued April 7, 1920).*
Part F: NEMATODA. By N. A. Cobb.....*(In preparation).*
Part G-H: TREMATODA AND CESTODA. By A. R. Cooper.....*(Issued February 4, 1921).*
Part I: TURBELLARIA. By A. Hassell.....*(In preparation).*
Part J: GORDIACEA.
Part K: NEMERTINI. By Ralph V. Chamberlin.....*(In preparation).*
Part L: SPOROZOA. By J. V. Mavor.....*(In preparation).*
Part M: FORAMINIFERA. By J. A. Cushman.....*(Issued February 6, 1920).*

## VOLUME X: PLANKTON, HYDROGRAPHY, TIDES, ETC.

Part A: PLANKTON. By Albert Mann.....*(In preparation).*
Part B: MARINE DIATOMS. By L. W. Bailey.....*(In preparation).*
Part C: TIDAL OBSERVATIONS AND RESULTS. By W. Bell Dawson..*(Issued October 1, 1920).*
Part D: HYDROGRAPHY.....*(In preparation).*

## VOLUME XI: GEOLOGY AND GEOGRAPHY

Part A: THE GEOLOGY OF THE ARCTIC COAST OF CANADA, WEST OF THE KENT. PENINSULA. By J. J. O'Neill.....*(Ready for press).*
Part B: MAPS AND GEOGRAPHICAL NOTES. By Kenneth G. Chipman and John R. Cox.
.....*(In preparation).*

## VOLUME XII: THE COPPER ESKIMOS

Part A: THE LIFE OF THE COPPER ESKIMOS. By D. Jenness.....*(Issued January 14, 1922).*
Part B: THE PHYSICAL CHARACTERISTICS OF THE WESTERN AND COPPER ESKIMOS. By D. Jenness.....*(In press).*
Part C: THE OSTEOLOGY OF THE WESTERN AND CENTRAL ESKIMOS
By John Cameron.....*(In press).*

## VOLUME XIII: TECHNOLOGY OF THE COPPER ESKIMOS

Part A: TECHNOLOGY OF THE COPPER ESKIMOS.....*(To be prepared).*

## VOLUME XIV: ESKIMO FOLK-LORE AND LANGUAGE

Part A: ESKIMO MYTHS AND TRADITIONS, FROM ALASKA, THE MACKENZIE DELTA, AND CORONATION GULF. By D. Jenness.....*(Ready for press).*
Part B: COMPARATIVE GRAMMAR AND VOCABULARY OF THE ESKIMO DIALECTS OF POINT BARROW, THE MACKENZIE DELTA, AND CORONATION GULF.
By D. Jenness.....*(In preparation).*

## VOLUME XV: ESKIMO STRING FIGURES AND SONGS

Part A: STRING FIGURES OF THE ESKIMOS. By D. Jenness.....*Ready for press).*
Part B: SONGS OF THE COPPER ESKIMOS.
By Helen H. Roberts and D. Jenness.....*(In preparation).*

## VOLUME XVI: ARCHAEOLOGY

CONTRIBUTIONS TO THE ARCHAEOLOGY OF WESTERN ARCTIC AMERICA.
.....*(To be prepared).*